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Subject: Year-End Summary Report for Research Done in Gray's Reef National Marine
Sanctuary (GRNMS)

Research conducted in 2001, at GRNMS and UGA produced a number of significant findings. Additionally, the synthesis of palynological data from the 2000 coring studies at the sanctuary was presented by Ms. Wendy Weaver in her UGA research thesis (Weaver, 2002). The principal research accomplishments for 2002 include:

- a. research dives in each month from July through October, 2002.
- b. introduction of observer status divers (2) to GRNMS; subsequent certification of one diver to AAUS status.
- c. two areas near station #20 extensively surveyed for paleontological and archaeological materials; area 37m to 58m, 210° South of station #20; area 14m to 16m 50° North of station #20.
- d. recovery of complete fossil scallops (n = 4) in area north of station #20 (see Figure 1).
- e. recovery of 53 (minimum # of individuals, MNI) oyster (Crassotrea) in area south of station #20 (see Figure 2).
- f. recovery of first identifiable stone artefact from GRNMS, in area south of station #20; an Archaic Period (ca. 8000-5000 BC) projectile/spear point (see Figure 3).
- g. identification, by Florida Museum of Natural History of fossil rib section of mammoth (Mammuthus) found at station #20, July, 2001.
- h. 1st optically - stimulated luminescence (OSL) dates for sand sediments taken

from FY2000, core #4; -30 cm spl. 24,023 +/- 4954 BP; - 170 cm spl. 23, 702 +/- 5499 BP.

- i. 1st radiocarbon dates (shell) of core #4 (FY 2000): - 30cm spl. 29,120+/- 680 BP; - 170 cm spl. 24,640 +/- 460 BP.

- j. delineation of a pollen sequence/stratigraphy for FY 2000 cores (#38 #5) dominated by pine (Pinus) and oak (Quercus) (Weaver, 2002). Reconciliation of pollen stratigraphy with the OSL and radiocarbon ages (see above, (h) & (i)) suggests a mid-to-late glacial timing for the sequence. An inversion in the pollen spectrum, observed in both spectra (see attached tables for cores 3 & 5), suggests an expansion of a colder interval - pine increases - at the lower portions of the cores (-134cm, core #3; -171cm, core #5). This event is in the later part of oxygen isotope stage 3 (Chappell and Shackleton, 1986). Models for northern hemisphere ice volume show a significant reduction (increase in oak?) in the Farmdale Interstade (ca. 25 ka BP) with increased volume peaks (increased pine?) at the Alton and Woodfordian intervals (ca. 37ka and 20ka BP). Resolution in these models is generally too coarse to detect a millennia - length excursion, in regional climate.

REFERENCES CITED:

1. Weaver, W. 2002. Paleoeecology and Prehistory: Fossil Pollen at Gray's Reef National Marine Sanctuary. Masters thesis. University of Georgia. Athens.

2. Chappell, J. and N.J. Shackleton. 1986. Oxygen isotopes and sea level. *Nature*, 324: 137-140.

Table 1. Pollen taxa and amounts per core depth in GRNMS core 5 (Weaver, 2002). Note decrease in oak (*Quercus sp.*) at 171 cm level.

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TAXA	Surface	11cm	21cm	31cm	41cm	57cm	81cm	96cm	121cm	134cm
<i>Pinus</i>	237	227	238	253	247	225	228	259		
<i>Picea</i>	0	0	0	0	0	0	0	0	0	0
<i>Taxodium/Juniperus</i>	7	1	0	3	3	0	1	0		
<i>Quercus</i>	54	45	32	30	47	48	54	12		
<i>Nyssa</i>	3	0	0	0	0	1	0	0		
<i>Alnus</i>	0	0	0	1	0	1	0	0		
<i>Liquidambar sp.</i>	0	5	7	5	6	6	6	4		
<i>Betula</i>	1	1	1	2	6	2	4	0		
<i>Carpinus/Ostrya</i>	8	1	2	1	0	2	0	1		
<i>Corylus</i>	0	0	0	0	0	0	0	0		
<i>Carya</i>	0	0	2	1	0	1	4	1		
<i>Ulmus</i>	0	0	2	1	2	0	0	0		
<i>Liriodendron tulipifera</i>	0	0	0	1	0	0	0	0		
<i>Fagus</i>	0	0	16	6	0	6	2	0		
<i>Salix</i>	0	0	0	0	0	1	0	0		
<i>Fraxinus</i>	0	0	0	0	0	0	0	0		
<i>Castanea</i>	0	0	1	0	0	1	0	0		
<i>Myrica</i>	0	0	0	0	0	0	0	0		
<i>Ilex</i>	0	0	0	0	0	0	0	0		
<i>Smilax</i>	0	0	0	1	0	0	0	0		
Graminae	0	0	0	0	0	0	0	0		
<i>Ambrosia type</i>	5	1	2	1	5	3	5	1		
<i>Artemisia</i>	0	0	0	0	0	1	0	0		
Chenopodiaceae	11	0	4	2	3	1	1	0		
<i>Plantago</i>	0	0	0	0	0	0	0	0		
<i>Lycopodium</i>	0	0	0	0	0	0	0	0		
<i>Osmunda</i>	0	0	0	0	0	0	1	0		
<i>Sphagnum</i>	0	0	0	0	0	0	0	0		
<i>Sagittaria</i>	0	0	0	12?	3?	6?	23?	7?		
<i>Myriophyllum</i>	0	0	0		0	0	0	0		
<i>Typha</i>	0	0	0	1	0	0	0	1		
Unknown and Indeterminate	9	11	37	32	18	29	10	21		
<i>Eucalyptus</i>	2863	3575	7180	4215	10133	11137	3904	1629		

Table 2. Pollen taxa and amount per depth in GRNMS core 3(Weaver, 2002). Trend is same,

decrease in oak, as seen in Table 1 but depth is 134 cm.

Figure 1. Scallop (sp. ?) Excavated north of station #20, GRNMS at reef front. Scale is 5 cm.



Figure 2. Five oyster station #20. Scale is 5

shell from area south of
cm.



Figure 3. Archaic Period (ca. 8000 - 5000 BC) projectile point from area south of station # 20. Scale is 5 cm.

